



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,651	02/19/2004	Robert J. Small	063254-5006-US1	7333

9629 7590 10/02/2007
MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER

ANGADI, MAKI A

ART UNIT	PAPER NUMBER
----------	--------------

1765

MAIL DATE	DELIVERY MODE
-----------	---------------

10/02/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/783,651	Applicant(s) SMALL ET AL.	
	Examiner Maki A. Angadi	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-3 and 5-9 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3/1/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-3 and 9 are rejected under 35 U.S.C. 103(a) over Tsuchiya (US Pub No. 2001/0018270) in view of Skrovan (US Patent No. 6,110,830).

As to claim 1, Tsuchiya discloses a composition for chemical mechanical planarization (paragraph 0002) consisting of an aqueous solution of ozone (paragraph 0039) and abrasive particles (paragraph 0030).

Tsuchiya is silent about the concentration of ozone in the aqueous solution. However, Skrovan discloses the concentration of ozone (1-20 ppm, or less than 0.01% (by atomic percent) (col.1, lines 64-67), 5-50% of ozone (col.4, lines 29-39, claim 1) in the polishing composition is less than that at which ozone interactions occur (col.3, lines 1-7, lines 18-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the concentration of ozone in the polishing composition selected by Tsuchiya because Skrovan illustrates various concentrations of ozone in the composition to minimize the abrasion of the aluminum-comprising layer (col.1, lines 62-65).

As to claim 2, Tsuchiya discloses abrasive particles contain silica abrasive (paragraph 0030).

As to claim 3, Tsuchiya discloses additive selected from the group consisting of carbonate (paragraph 0038) and acetic acid (paragraph 0041).

As to claim 9, Tsuchiya discloses an additive such as oxalic acid (paragraph 0033).

Claim Rejections - 35 USC § 103

2. Claim 8 is rejected under 35 U.S.C. 103(a) over Tsuchiya (US Pub No. 2001/0018270) in view of Skrovan (US Patent No. 6,110,830) as applied to claim 1 above, in further view of Hosali (US Patent No. 5,738,800).

Tsuchiya discloses the use of silica (paragraph 0030) as an abrasive in the polishing composition but is silent about other additives. However, Hosali discloses the use of ceria in the polishing composition (col.2, line 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select ceria and other abrasives in the polishing composition used by Tsuchiya because Hosali teaches that ceria abrasive particles in the slurry provide an effective polishing abrasive for CMP at all pH conditions and is stable against gelation (col.2, lines 55-57).

Claim Rejections - 35 USC § 103

3. Claim 5 are rejected under 35 U.S.C. 103(a) over Tsuchiya (US Pub No. 2001/0018270), in view of Skrovan (US Patent No. 6,110,830) as applied to claim 1 above, in further view of Chino (US Patent No. 6,124,210).

As to claim 5, Tsuchiya fails to disclose the concentration of ozone in the composition. However, Chino discloses the concentration of ozone in terms of g/Nm³ (col.6, lines 31-39). The concentration of 100 g/Nm³ appears to provide minimum defect concentration for a process time of 90 sec. Therefore, it would

have been obvious to one of ordinary skill in the art at the time the invention was made to select the ozone concentration because Chino teaches that the number of circular defect is reduced as the progress of the process time for a given ozone concentration (col.7, lines 46-50).

Claim Rejections - 35 USC § 103

4. Claims 6-7 are rejected under 35 U.S.C. 103(a) over Tsuchiya (US Pub No. 2001/0018270) in view of Skrovan (US Patent No. 6,110,830) as applied to claim 1 above, in further view of Chopra (US Patent No. 6,429,133).

As to claim 6, Tsuchiya discloses presence of alkali salts in the composition (paragraph 0038) but fails to cite the presence of ammonium salts. However, Chopra discloses the presence of ammonium salt in the composition (col.3, lines 32-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select ammonium salt in the composition of Tsuchiya because Chopra illustrates that adding ammonium salt to the solution prevents redeposition and agglomeration (col.8, lines 10-14).

As to claim 7, Tsuchiya discloses the presence of alkali salts such as sodium and potassium carbonate and ammonia, in the composition (paragraph 0038) but fails to cite the presence of ammonium carbonate. Chopra discloses the use of ammonium carbonate in the slurry composition (col.8, lines 21-24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select ammonium carbonate in the composition of Tsuchiya because Chopra illustrates that ammonium carbonate serves as a complexant to prevent redeposition and agglomeration, both of which may result in surface defects if not prevented (col.8, lines 11-14).

Response to Arguments

5. Applicant's arguments filed on July 23rd, 2007 have been fully considered but they are not persuasive.

(a) *With respect to amended claim 1*, applicants' arguments regarding the concentration of ozone are not persuasive in overcoming the rejection because prior art of Skrovan clearly identifies the concentration of ozone in the polishing composition (see arguments on page 3).

(b) *With respect to claim 5*, applicants' arguments asserting that the combined reference of Tsuchiya and Chino fail to disclose the concentration of ozone less than 20 ppm are not convincing. The reference of Skrovan teaches the concentration of ozone in the polishing composition (see arguments on page 3).

(c) *With respect of claims 6 and 7*, the combined reference of Tsuchiya, Skrovan and Chopra teaches the use of ammonium salt in conjunction with aqueous solution of ozone.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Grieger (US Patent No. 6,100,198) discloses a post-planarization, pre-oxide removal ozone treatment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maki A. Angadi whose telephone number is 571-272-8213. The examiner can normally be reached on 8 AM to 4.30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on 571-272-1465. The

Art Unit: 1765

fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dr. Maki Angadi
Examiner
Art Unit 1765

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER
Nadine